

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions and listings of the claims in this application.

Listing of the Claims:

1. (Currently amended) A distillation process for comprising:
removing a compound ~~which bears~~ that includes at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group, from a mixture, ~~which~~ wherein the mixture comprises
a the compound ~~which bears~~ that includes the at least two functional groups ~~which are~~
~~each independently selected from the group consisting of nitrile group, carboxylic acid group,~~
~~carboxylic ester group and carboxamide group,~~ and
a compound which is homogeneous with respect to the mixture and comprises rhodium,
by distillation wherein the distillation is ~~carried out~~ conducted at an average mean residence time
~~in the range~~ from 1 to 45 minutes.
2. (Currently amended) The process according to claim 1, wherein the distillation is
~~carried out~~ conducted at a temperature ~~in the range~~ from 50 to 200°C.
3. (Currently amended) The process according to ~~either of claims 1 and 2~~
claim 1, wherein the compound ~~used~~ which bears that includes the at least two functional groups
~~which are each independently selected from the group consisting of nitrile group, carboxylic acid~~
~~group, carboxylic ester group and carboxamide group~~ is a monoolefinically unsaturated
compound.

4. (Currently amended) The process according to claim 3, wherein the monoolefinically unsaturated compound ~~used is a compound which is obtainable~~ is obtained by dimerizing two terminal olefins, ~~which bear the functional groups required to prepare the monoolefinically unsaturated compound comprising~~ wherein each of the two terminal olefins comprises at least one of the at least two functional groups.

5. (Currently amended) The process according to claim 4, wherein the terminal olefins ~~used are two olefins which~~ each independently have the formula $H_2C=CHR$ in which R is a nitrile group, carboxylic acid group, carboxylic ester group or carboxamide group.

6. (Currently amended) The process according to ~~either of claims 4 or 5~~ claim 4, wherein the dimerization is ~~carried out~~ conducted in the presence of a ~~compound~~, as a catalyst, which is homogeneous with respect to the reaction mixture and comprises rhodium, ruthenium, palladium or nickel.

7. (Currently amended) The process according to ~~either of claims 4 or 5~~ claim 4, wherein the dimerization is ~~carried out~~ conducted in the presence of a ~~compound~~, as a catalyst, which is homogeneous with respect to the reaction mixture and comprises rhodium.

8. (Currently amended) The process according to ~~any of claims 1 to 7~~ claim 3, wherein the monoolefinically unsaturated compound ~~used which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is hexenedioic diester.

9. (Currently amended) The process according to ~~any of claims 1 to 7~~ claim 3, wherein the monoolefinically unsaturated compound ~~used which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is butenedinitrile.

10. (Currently amended) The process according to ~~any of claims 1 to 7~~ claim 3, wherein the monoolefinically unsaturated compound ~~used which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is 5-cyanopentenoic ester.

11. (Currently amended) The process according to ~~either of claims 1 and 2~~ claim 1, wherein the compound ~~used which bears that includes the~~ at least two functional groups ~~which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is a saturated compound.

12. (Currently amended) The process according to claim 11, wherein a ~~the~~ saturated compound is ~~used which is obtainable~~ obtained by hydrogenating a ~~the~~ monoolefinically unsaturated compound ~~which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group, carboxamide group, obtainable by a process according to any of claims 3-10~~ claim 4.

13. (Currently amended) The process according to claim 12, wherein the hydrogenation is ~~carried out~~ conducted in the presence of a ~~compound~~, as a catalyst, which is homogeneous with respect to the reaction mixture and comprises rhodium, ruthenium, palladium or nickel.

14. (Currently amended) The process according to claim 12, wherein the hydrogenation is ~~carried out~~ conducted in the presence of a ~~compound~~, as a catalyst, which is homogeneous with respect to the reaction mixture and comprises rhodium.

15. (Currently amended) The process according to ~~any of claims 11 to 14~~ claim 11, wherein the saturated compound ~~used which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is adipic diester.

16. (Currently amended) The process according to ~~any of claims 11 to 14~~ claim 11, wherein the saturated compound used ~~which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is adipodinitrile.

17. (Currently amended) The process according to ~~any of claims 11 to 14~~ claim 11, wherein the saturated compound used ~~which bears at least two functional groups which are each independently selected from the group consisting of nitrile group, carboxylic acid group, carboxylic ester group and carboxamide group~~ is 5-cyanovaleric ester.

18. (Currently amended) The process according to ~~either of claims 7 and 14~~, wherein claim 7, further comprising hydrogenating the monoolefinically unsaturated compound with the same rhodium-comprising compound is used as a catalyst used in the hydrogenation and the dimerization.

19. (Currently amended) The process according to ~~any of claims 1 to 18~~ claim 1, wherein the rhodium-comprising compound used ~~which is homogeneous with respect to the mixture~~ is of the formula $[L^1RhL^2L^3R]^+X^-$ where

L^1 is an anionic pentahapto ligand;

L^2 is an uncharged 2-electron donor;

L^3 is an uncharged 2-electron donor;

R is selected from the group consisting of H, C_1 - C_{10} -alkyl, C_6 - C_{10} -aryl and C_7 - C_{10} -aralkyl ligands;

X^- is an noncoordinating anion;

and optionally, where two or three of L^2 , L^3 and R are joined ~~if appropriate~~.

20. (Original) The process according to claim 19, wherein L^1 is pentamethylcyclopentadienyl.

21. (Currently amended) The process according to ~~either of claims 19 and 20~~ claim 19, wherein X^- is selected from the group consisting of BF_4^- , $B(\text{perfluorophenyl})_4^-$, $B(3,5\text{-bis(trifluoromethyl)phenyl})_4^-$ and $Al(OR^F)_4^-$,

where R^F is ~~identical or different~~ part-fluorinated or perfluorinated aliphatic or aromatic radicals, ~~in particular perfluoroisopropyl or perfluoro-tert-butyl~~.

22. (Currently amended) The process according to ~~any of claims 19 to 21~~ claim 19, wherein L^2 and L^3 are each independently selected from the group consisting of C_2H_4 , $CH_2=CHCO_2Me$, $P(OMe)_3$ and $MeO_2C-(C_4H_6)-CO_2Me$.

23. (Currently amended) The process according to ~~any of claims 19 to 21~~ claim 19, wherein L^2 and L^3 ~~together~~ are joined as one ligand selected from the group consisting of acrylonitrile and 5-cyanopentenoic ester.

24. (Currently amended) The process according to ~~any of claims 19 to 22~~ claim 19, wherein L^2 and R ~~together~~ are joined as one ligand, $-CH_2-CH_2CO_2Me$.

25. (Currently amended) The process according to ~~any of claims 19 to 22 or 24~~ claim 19, wherein L^2 , L^3 and R ~~together~~ are joined as one ligand, $MeO_2C(CH_2)_2-(CH-)-(CH_2)CO_2Me$.

26. (Currently amended) The process according to ~~any of claims 19 to 25~~ claim 19, wherein the rhodium-comprising compound ~~which is homogeneous with respect to the mixture~~ is selected from the group consisting of

$[Cp^*Rh(C_2H_4)_2H]^+ BF_4^-$,
 $[Cp^*Rh(P(OMe)_3)(CH_2=CHCO_2Me)(Me)]^+ BF_4^-$,
 $[Cp^*Rh(-CH_2-CH_2CO_2Me)(P(OMe)_3)]^+ BF_4^-$,
 $[Cp^*Rh(MeO_2C(CH_2)_2-(CH-)-(CH_2)CO_2Me)]^+ BF_4^-$,
 $[Cp^*Rh(C_2H_4)_2H]^+ B(3,5\text{-bis(trifluoromethyl)phenyl})_4^-$,
 $[Cp^*Rh(P(OMe)_3)(CH_2=CHCO_2Me)(Me)]^+ B(3,5\text{-bis(trifluoromethyl)phenyl})_4^-$,
 $[Cp^*Rh(-CH_2-CH_2CO_2Me)(P(OMe)_3)]^+ B(3,5\text{-bis(trifluoromethyl)phenyl})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{MeO}_2\text{C}(\text{CH}_2)_2-(\text{CH}-)(\text{CH}_2)\text{CO}_2\text{Me})]^+ \text{B}(3,5\text{-bis(trifluoromethyl)phenyl})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{C}_2\text{H}_4)_2\text{H}]^+ \text{B}(\text{perfluorophenyl})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{P}(\text{OMe})_3)(\text{CH}_2=\text{CHCO}_2\text{Me})(\text{Me})]^+ \text{B}(\text{perfluorophenyl})_4^-$,

$[\text{Cp}^*\text{Rh}(-\text{CH}_2-\text{CH}_2\text{CO}_2\text{Me})(\text{P}(\text{OMe})_3)]^+ \text{B}(\text{perfluorophenyl})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{MeO}_2\text{C}(\text{CH}_2)_2-(\text{CH}-)(\text{CH}_2)\text{CO}_2\text{Me})]^+ \text{B}(\text{perfluorophenyl})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{C}_2\text{H}_4)_2\text{H}]^+ \text{Al}(\text{OR}^{\text{F}})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{P}(\text{OMe})_3)(\text{CH}_2=\text{CHCO}_2\text{Me})(\text{Me})]^+ \text{Al}(\text{OR}^{\text{F}})_4^-$,

$[\text{Cp}^*\text{Rh}(-\text{CH}_2-\text{CH}_2\text{CO}_2\text{Me})(\text{P}(\text{OMe})_3)]^+ \text{Al}(\text{OR}^{\text{F}})_4^-$,

$[\text{Cp}^*\text{Rh}(\text{MeO}_2\text{C}(\text{CH}_2)_2-(\text{CH}-)(\text{CH}_2)\text{CO}_2\text{Me})]^+ \text{Al}(\text{OR}^{\text{F}})_4^-$,

where R^{F} is ~~identical or different~~ part-fluorinated or perfluorinated aliphatic or aromatic radicals, ~~in particular perfluoroisopropyl or perfluoro-tert-butyl~~.

27. (Currently amended) The process according to ~~any of claims 1 to 26~~ claim 1, wherein the distillation is ~~carried out~~ conducted at a pressure ~~in the range~~ from 0.05 to 50 kPa.

28. (New) The process according to claim 18, wherein the rhodium-comprising compound is of the formula $[\text{L}^1\text{RhL}^2\text{L}^3\text{R}]^+\text{X}^-$ where

L^1 is an anionic pentahapto ligand;

L^2 is an uncharged 2-electron donor;

L^3 is an uncharged 2-electron donor;

R is selected from the group consisting of H, $\text{C}_1\text{-C}_{10}$ -alkyl, $\text{C}_6\text{-C}_{10}$ -aryl and $\text{C}_7\text{-C}_{10}$ -aralkyl ligands;

X^- is a noncoordinating anion;

and optionally, where two or three of L^2 , L^3 and R are joined.

29. (New) The process according to claim 21, wherein X^- is $\text{Al}(\text{OR}^{\text{F}})_4^-$ and R^{F} is perfluoroisopropyl or perfluoro-tert-butyl.

30. (New) A process for removing adipic diester, adiponitrile or 5-cyanovaleric acid from a reaction mixture, the process comprising:

providing a reaction mixture, said mixture comprising the adipic diester, adiponitrile or 5-cyanovaleric acid, and one or more catalysts, said catalysts independently selected from rhodium, ruthenium, palladium or nickel catalysts; and

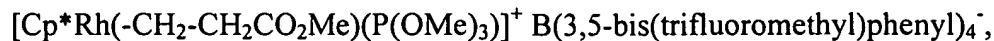
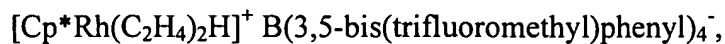
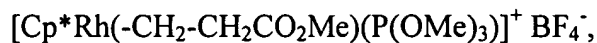
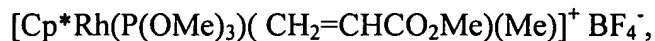
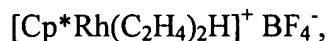
distilling the adipic diester, adiponitrile or 5-cyanovaleric acid from the reaction mixture at an average mean residence time from 1 to 45 minutes, and at a bottom temperature of from 50 to 200 °C.

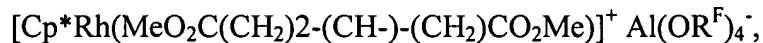
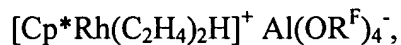
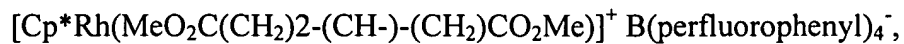
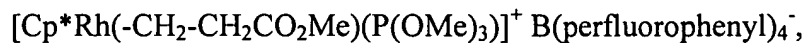
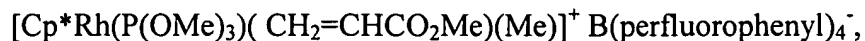
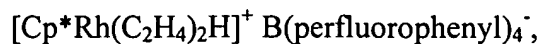
31. (New) The process according to claim 30, wherein the adipic diester, adiponitrile or 5-cyanovaleric acid is obtained by dimerizing two terminal olefins, wherein each of the terminal olefins comprises at least one functional group which are each independently selected from the group consisting of nitrile, carboxylic acid, and carboxylic ester, in the presence of a rhodium catalyst.

32. (New) The process according to claim 31, further comprising hydrogenating the dimerized product of the two terminal olefins in the presence of a hydrogenation catalyst.

33. (New) The process according to claim 32, wherein the hydrogenation catalyst is the rhodium dimerization catalyst.

34. (New) The process according to claim 33, wherein the rhodium catalyst is selected from the group consisting of





where R^{F} is part-fluorinated or perfluorinated aliphatic or aromatic radicals.